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Edited by JOHN BARTLETT.

PHOTOGRAPHY AND GENRE PAINTING.

DUTCH painting is generally looked upon as a sort of degenerate art, a mere representation of commonplace scenes and incidents, without any other aim or purpose than the desire to actually reproduce what the painter saw before him.

It is true the painters do lack what we moderns call motive.

For more than a century they seem to have thought of nothing else but how to paint. They did not concern themselves much about the moral aim of art.

Even the eventful history of the times did not awaken any gleam of enthusiasm to express upon their canvases the stirring scenes about them.

They seem rather to have shunned the excitement of the period of storm and stress, and to have sought retirement where they might paint for paint's pure sake.

They preferred to picture servant girls with brooms, or peasants drinking at ale house doors, or boors in a field, or cows at pasture, or skaters on a canal, to scenes of pathos, suffering and passion, which would have aroused us to a high state of feeling.

They have accordingly been accused of a low-bred taste, of being of the earth exceedingly earthly.

They went calmly and deliberately on, bestowing the most elaborate care upon the detail of what we would call the commonest things of a very common life.

Millet, the French painter of rural life, has a more spiritual apprehension of rustic labor. He expresses in the external forms the inner life of his peasants. His shepherds, his goose girls, his clowns, are embodiments of thought, of deep feeling—things a Dutchman never dreamed of. There is not even sentiment in the Dutch painters.

In every exhibition of modern work we find subjects suggested by some passage from a poet or novelist, or from the Bible or history, or it may be from actual life. There is always an attempt made to express the theme pathetically. Even landscape is made to convey the particular mood or temperament of the artist. Now, all this never entered into the mind of the Dutch painters, and yet our modern art owes a great debt to the Dutch school.

It was the first to break away from the dominancy of the classical pedantry; that school which sought to dress nature to advantage, to rectify her crudities, to tone down her defects; in a word, to present the actual world as it is not, rather than as it is.

This school held the traditions of the past to be inviolable—there was no escape from them. Certain laws and definite proportions derived from fanciful divisions of the human figure were universally applied.

Nature was subordinate to man; the trees, the sky, the atmosphere, were idealized out of all recognition, so as not to interfere with the humanized classical conception of the universe.

We ought to be thankful for the Dutch commonplace revolt against this classical pedantry.

Man was put, by Dutch painters, in his true place in nature, although at first in a very humble attitude. Sometimes he was left out altogether, to show that nature was not wholly dependent upon him.

As Eugene Fromentin says: "The time had come to think less, to aim not so high, to observe more closely, and to paint the multitude, the citizen, the workman.

"The time had come for art to make herself humble for humble themes, little for little themes, to accept all things without disdain, to enter familiarly into their intimacy, to study them with an affectionately attentive curiosity.

"Genius henceforth is to be without prejudice, and not to know that it has knowledge, but to accept every day the fresh teachings of the model. It no longer either embellishes anything or ennobles anything, at least, consciously; and yet, in every artist deserving the name, there exists a power which operates in spite of himself, and turns even the most commonplace materials into works of art."

They had a tenderness for what is true, a cordiality for what is real, which gives a value to their productions which their materials do not seem to possess.

Sincerity is the chief characteristic of Dutch art. Everything that came within the bounds of the scene they represented was treated conscientiously.

The skies of Dutch painters, to be sure, cannot be compared with Turner's gorgeous cloud effects. Though simple, they are true to nature. Their clouds really float in their atmosphere, and do not look as if they were plastered against a blue canvas vault, like those we see in more modern pictures.

Hamerton says the Dutchmen did not attempt to render the glorious coloring of sunrise and sunset, nor the lurid gloom of a gathering storm, nor the grace and beauty of the ethereal clouds, which seem like diaphanous robes of angels trailing on the deep azure of the highest heavens. But, on the other hand, what they did attempt they succeeded in singularly well. They got the true sky quality, they got the space, and air, and light; and apparently by the very simplest means: for all Dutch skies look as if one could copy them quite accurately in two or three sittings; an impression which is utterly delusive, for there is hardly an artist in Europe who could copy them at all.

The whole of Dutch painting has this facile, unpretending appearance. However labored it was, and we know positively that it was often painfully labored, it never obtrudes science or toil upon the notice of the spectator.

We give this brief synopsis of the characteristics of the Dutch painters, because we believe that the photographer will find the sphere of their labors ample enough for his artistic aspirations. The reproduction of scenes and incidents of every-day life, if sincerely and honestly expressed, will show much more a taste and feeling for art than all the subjects of melodramatic inflation a perverted fancy may devise.

We are sorry to be obliged to confess that there is an increase at every annual exhibition of professional work of subjects of a theatrical character verging on the grandiose and ridiculous.

We fear the influence of the high art talkers in our magazines is too thoroughly leavening the whole mass to hope for a reformation just now. A return to simple themes simply rendered is to be wished for.

The most celebrated painters of our day are convinced of the artistic aspects of our modern life. We do not merely mean rural life, with its picturesque landscape setting, but our modern social life and its surroundings.

The subject selected should be of more importance than the mode of expression.

It is necessary to look for something besides material rules of composition. It is not necessary to focus one's interest upon the pyramid formed of the objects in your picture, or on the balancing of lines, etc.

If the rules are badly followed, your result will be miserable, but if rigidly followed you will produce a conventional picture, quite as disagreeable to an observer of taste.

Rules of composition are instinctively felt by good artists. No picture can be constructed by obeying a set formula, but must spring spontaneously from the artist's own conception of what is pleasing.

The picture which forms the frontispiece to THE AMERICAN JOURNAL for this month has nothing poetic or ideal about it. It is essentially commonplace, and yet we think the subject more pleasing to the general observer than the rendering of a theme unsuited to the purposes of photographic art, whether sentimental or melodramatic.

The author arranged the parts of the picture with no other design than to convey the idea suggested by the title, and yet, if analyzed, its building-up conforms to the rules of artistic composition. The composition of the little group at the corner of the mantelpiece, was by no means intentional, having been arranged solely to please the eye of the photographer, who did not notice it conformed to the set rules until the fact was pointed out.

It may be interesting to know that the accessories of the photograph are of the simplest character. A board roughly nailed to two uprights covered with paper constitutes the mantelpiece. A piece of dark cloth simulates the recess of the fireplace. The rest of the objects are such as could be hastily gathered together and be appropriate to the subject. The whole time occupied in arranging the scene, including the posing of the cronies, did not occupy more than thirty minutes. The photograph was taken at a time of day when the photographer knew there would be suitable gradations of light and shade upon the objects and the background, so as to secure proper values in the picture. However, he was repaid for his pains by the criticism of a professional photographer, who remarked that the picture would have been better had the back-ground been more uniformly illuminated instead of gradating diagonally from dark to light. The twilight effect in the original photograph, so appropriate to the theme, has unfortunately been lost in the reproduction, but some of the other qualities have been retained, and the whole effect is pleasing.

NOTES.

CHALKY PHOTOGRAPHS.—The necessity of direct sunshine for fine effects in landscape photography has become almost a truism; without its agency it is claimed that no brilliancy or sparkle can be secured.

It must be confessed that contrast is essential to pictorial effect, and that photographs taken upon a dull, cloudy day are flat and tame, and generally without artistic value; but, to judge from the majority of landscape photographs one sees, the tendency is to exposure when the sun pours forth too powerfully its glare. Pictures taken under such conditions are necessarily very strong in the high lights, while the shadows register only a minimum amount of the reflected rays. The result is a chalky, hard negative; one of that sort which calls forth the remark, "Was it snowing at the time?"

The effect is never that which painters give of a sunlit landscape. The truth is no landscape painter would paint a scene so illuminated. He would select the time of day when a softer light prevailed: a light which would give contrast and sparkle perhaps, but at the same time soft and delicate shadows.

We know that chalkiness is due in large measure to improper development, and that many a view is made hard by an injudicious use of pyro, but even with the most skilled development a too strongly illuminated scene will be violent and unnatural. In viewing such a landscape, we naturally half close our eyes, so as to modify the influx of the sunshine, and so soften the impression, whilst the sensitive plate remorselessly registers the full glare.

To go a little further, we have often wondered why the landscape photographer does not employ our rapid plates in securing some of the beautiful effects after sundown. By pointing his camera directly against the western sky (another heresy) he would secure brilliancy and contrast with the foliage, and the long shadows cast upon the ground would effectually break up the foreground and give interesting pictures. He would also better secure what are called "values" in his picture, the weights of light and dark, which so charm us in the paintings of Corot.

Some very beautiful results are also obtained when the sun is just peeping from out a heavy mass of cloud. At such a time the high lights of the scene are suffused in a soft light, and the shadows are full of richness, all of which disappears when the sun breaks forth in its full strength. We think that if the sunshine were tempered with a little obscuration when we are out landscaping, we would not be asked whether the snow was falling at the time we took our view.

MANNERISM IN PHOTOGRAPHY.—The demand for artistic qualities in a photograph, and the desire of the photographer to comply with the demand, have caused to be published a number of works for guidance into the paths of art.

Some of these books are admirable, the outcome of the experience of practical workers; but a good many are mere compilations of set phrases, wholly inapplicable to photography. They really do more harm than good.

The charm of a good photograph is its perfect naturalness, its naïveté; but when the photographer distrusts his natural talent, and relies upon the aphorisms of the books to construct his picture according to the set rules, nothing is more detestable.

How often the enjoyment of a good photograph has been ruined by the constraint manifest in the attempt to squeeze everything within the lines of a pyramidal structure.

Example is better than precept, and more can be learned by study of the original work of painters than by implicit faith in the directions of any rule makers.

EXHIBITORS AND CRITICS.—Photographic exhibitions do a good work in diffusing a taste for art, but the critics who sit in judgment often neutralize the effect by their expressed opinions of the merit of the individual work. The refinement of the classification they adopt excludes many a picture from a claim to recognition for good qualities.

The multiplication of heads, no doubt, is intended to facilitate arrangement, but it takes a photographic Hercules to properly deal with such a hydra.

If the judges would cast aside the fine distinctions, and judge solely of the merits, artistic and technical, there would be more satisfaction on the part of the exhibitors; and what have the judges to do with the facts blazoned upon the little placards so conscientiously attached to each frame—"Instantaneous process," "W. & X.'s plates, Y.'s lens, f 24," "Special process," etc., etc? Is not all this intelligence mere advertisement for somebody? We have seen manufacturers busy at our exhibitions, counting from these cards the number of exhibits made upon their plates, all of which duly appeared in our journals of photography.

We have somewhat against the judgment of the management of the recent Joint Exhibition at Boston, where this absurd refinement of classification had its full sweep, but we think the plan of excluding everything from the frame but the picture most praiseworthy.

The exhibits stand for just what they are worth, and judgment is not darkened by words without knowledge.

Let the award be for *work*, pure and simple, and there will be a better record gained of the progress of photography than can be had from a list of premiums for specialties.

RELATION OF SENSITIVENESS TO DEVELOPMENT.—It has frequently been suggested that the sensitiveness of a plate as a quality *per se* has no existence, but is merely a condition relative to the agent employed in development. The simple fact that one form of development will not call forth as good an image as another is evidence that the action of the light upon the sensitive film, however feeble, is still there, and capable of giving a vigorous result at the call of the proper agent.

Our alkaline pyro, it is true, is a vigorous developer, but then there are other conditions involved in the construction of the sensitive film which prevent its making use of its full energy.

Alkaline pyro, as a reducing agent, must be held in check, from the great tendency of plates to fog. To be sure, we have agents which tend to prevent the formation of fog; but the drawback to their use is their action in weakening or retarding the full force of the developing agent.

RESTRainers AND RETARDERS.—But little distinction is usually made between the terms restrainer and retarder; they are used indiscriminately. A restrainer may act as a retarder, or a retarder may act as a restrainer; but it is possible to have a restraining action without retardation, or retardation without restraining action.

Acid in small quantity will prevent a too precipitous reduction of the silver salt in solution, and is, therefore, a restrainer, preventing the image from forming too rapidly, but if an excess is used it retards, even entirely destroys, the power of the sensitive film to respond to the developer.

Gelatine, sugar, gum, etc., added to the developer, restrain by their presence. The deposit is kept in check and the formation of the image progresses slowly.

These colloidal bodies, as they are called, act like mechanical blocks or hindrances, so that the developer must make detours, as it were, to reach the bromide of silver particles.

The action of soluble bromides in restraining, is, however, different. We know that of all the combinations of bromide with the metals, that with silver is the strongest. Bromide will hold longer on to a particle of silver than it will to anything else. Its affinity, for instance, for potassium or ammonium, is much feebler. So that when we add potassium bromide or ammonium bromide to the developer, the alkaline pyro attacks these combinations in preference to the silver bromide, and the full force of its attack upon the film is restrained.

Certain bodies may also act as accelerators by their mechanical action upon the film, preparing the way for the more easy penetration of the developer.

SLOW OR RAPID DEVELOPMENT.—How often does one hear the advocates for one or the other method of development descant upon the virtues of a special formula by which good results, they say, are sure.

Undoubtedly they do achieve good results; good, not only in their own estimation, but by general acclaim, yet it is unwise for them to think that their method is applicable to all cases.

Really, any pet method of development is only the result of its adaptation to the peculiar conditions controlling the exposure.

Professional photographers are more prone than amateurs to adhere to the stereotyped plan which experience has taught them to be the best for conditions under which they work.

Work under the skylight is reduced to a certain degree of uniformity. Experience teaches that the most satisfactory results are secured by a certain regulation in the developer, but, forgetting the pains by which their knowledge was gained, they imagine they have discovered the talisman by which all plates exposed under all sorts of conditions shall yield rich, beautiful negatives.

They fail to appreciate the fact that should they move their quarters so as to change the character of their light, or should they exercise their skill in some new direction, there would be a necessity for a corresponding change in the method of development to obtain as good results as formerly.

Development is truly a fine art, and when one is obliged to work with so many variables in the problem—difference of light, situation, character of subject, etc.—it requires almost constant practice to keep to uniformity of good results.

BEAUTIFUL NEGATIVES AND POOR PRINTS.—It is well known that there is no absolute assurance that a brilliant negative will yield a rich print; on the contrary, what is called a beautiful, plucky negative not infrequently disappoints the photographer by the indifferent character of the result obtained in the positive, while a comparatively thin, weak negative, by judicious printing, gives a most artistic and beautiful picture, rich in half-tones, soft in the high lights, and delicate in the shadows.

We know it is the ambition of some manipulators to obtain brilliant negatives, which they exhibit with pride. Verily, they are entitled to their reward of praise, but we think those wiser who regard the negative only as one of the instruments, like the camera and lens, for obtaining the final result—a beautiful photograph.

We do not wish to be understood as advocating careless or indifferent manipulation, but we do believe that less stress should be laid on good chemical effects, and more on the artistic merits of final results.

LENS *vs.* CRITIC.—Correct power of observation in judging of the relative size of the different portions of the human body, is not possessed by every one—not always by the painter, who, to justify his distortion, sometimes condemns indiscriminately all photographic lenses.

But the lens is sometimes faithful in its delineations, the artistic critic out of his cue in his sweeping condemnation of optical failings.

Feet are generally much larger in proportion to the figure than most people imagine, and many a pair of hands has been unjustly ridiculed in a photograph for their enormity when they were true to nature, although the photographer might have used more discretion in not posing them so obtrusively.

Leslie tells a story about the Duke of Wellington: "When I had sketched his figure I asked him to look at it. He said, 'You have made my head too large, and this is what all the painters have done to whom I have sat. Painters are not aware how very small a part of the human figure the head is.'"

The great Duke undoubtedly was not great in his criticism. Inferior painters always paint the head too small. We are apt to criticise a photograph when it gives the seat of intellect its just proportions.

TRANSFERO TYPES AND ETCHINGS.—If an etching is printed on Japanese paper and laid upon a brilliant white card mount, it becomes in an instant most luminous and beautiful. The light from the white board shines through the semi-transparent Japanese paper, and gives the etching a brilliancy it did not possess before. Upon a dull surface its beauties would be lost, and one would be disappointed, no matter how good its artistic qualities.

The idea occurred to us that the new variety of photographs, the transferotype, made by the Eastman Company, might have its good qualities enhanced by like process of transfer to a brilliant white mount. We were not only surprised but delighted with the increased brilliancy conferred upon it. The facility with which the impressions may be transferred to any variety of objects, opens a pleasant path for exercise of taste in artistic decoration. Tiles and plaques can be made most beautiful by transfer of photographs of flower and fruit subjects, but if the most artistic results are desired, we would recommend a brilliant white background as the recipient of the impression of the transferotype.

A NEW DEVELOPER—HYDROXYLAMINE AND PYRO.

Read before the Philadelphia Photographic Society, June 6th, 1888.

WITHIN the past few months considerable attention has been directed in photographic circles to hydroxylamine, a new chemical, and claimant for a position in the ranks of the developing agents. Attention was first called to it by Prof. Eder, in Dingler's *Journal* for 1887, p. 225, who recommends the following method for its use.

- (A) Hydroxylamine chloride 1 part, dissolved in alcohol 15 parts;
- (B) Caustic soda 1 part, dissolved in water 8 parts.

For use, mix 3 to 5 parts of A, and 5 parts of B, with 60 parts of water. This formula, however, when tested by other observers has been found to be very unsatisfactory, the powerful action of the caustic soda causing blistering and reticulation of the gelatine film of the photographic plate, while if a weaker alkaline combination is used, such as the carbonate, no image can be evolved.

In the January number of THE AMERICAN JOURNAL OF PHOTOGRAPHY, Mr. J. G. Cassebaum, a member of this Society, called attention to the value of hydroxylamine in combination with pyro as a developer, not only for negative plates, but also for transparencies and lantern slides, claiming that it produced a wonderful clearness in the shadows and brilliancy in the higher lights, and gave a beautiful bluish black tone, rich in gradations and soft and pleasing to the eye. The addition of hydroxylamine to the developer also acted as a preservative, keeping the pyro solution clear and active for a long time. Mr. Cassebaum's results have been corroborated by Mr. H. G. Stebbins, of New York, in a paper published in Anthony's *Photographic Bulletin*, p. 141, 1888. While I, therefore, cannot claim anything particularly new for the subject I propose to discuss this evening, I desire, briefly, to show what can be done with this new agent, and to offer a few suggestions for its proper use. Before going into further details, however, let us look for a moment at the chemistry of hydroxylamine.

Hydroxylamine, represented by the formula OH, NH₂, is a combination of hydroxyl (OH) the radical of water, and the univalent radical amidogen (N H₂). It was discovered by Lossing in 1865. It is a very volatile and easily decomposable base, and can be obtained only in solution. It is formed when ethyl nitrite is acted upon by tin and hydrochloric acid, or by the action of hydrochloric acid on tin and ammonium nitrate; also by the action of sodium bisulphite and nitrite of sodium with solution of potassium chloride. Hydroxylamine is really an ammonia in which hydroxyl (OH) has been substituted for one atom of hydrogen.



It forms definite salts with the acids, and its combination with hydrochloric acid, hydroxylamine chloride, is the salt which has been used in recent experimentation.

Hydroxylamine chloride is found in commerce in the form of beautiful, colorless, transparent tables, very much resembling nitrate of silver crystals, only possessing rather a more waxy appearance. It is quite soluble in water, moderately so in alcohol, and although more stable than its base, is still gradually decomposed by the action of light and air, and hence should be kept in a closely stoppered bottle and ex-

cluded from the light. Its photographic value resides in its avidity for oxygen, it breaking up again into water (OH_2) and hydrochloric acid. It is a great reducing agent, and hence is especially valuable for photographic work. There are several makes of hydroxylamine chloride at present in the market, some of which are much discolored and impure. I am indebted to Mr. F. H. Rosengarten, of Rosengarten & Son, for that which I have used in my experiments, and have found it to be very pure, and of excellent quality.

When combined with pyrogallol, hydroxylamine chloride exerts a double action. First, by its absorptive capacity for oxygen it serves to partially protect the pyrogallol from decomposition, and secondly, when mixed with the alkalies or their carbonates in the process of development, a certain quantity of chlorine is liberated, which combines with a certain proportion of the alkali to form an alkaline chloride, which salt exerts the same retarding influence on the development as do the alkaline bromide salts. It is even probable that its action may be better than that of the bromides for preserving detail and keeping the shadows clear, as the quantity of the salt formed is quite small, its action takes place gradually and progressively, and the chloride formed is in a nascent condition when its modifying influence is exerted.

During the past two months I have made a quite extensive use of this combination of pyrogallol and hydroxylamine chloride, not only as a developer for negatives, but also for developing transparencies and lantern slides, and I can fully corroborate the excellent results which have been obtained by the gentlemen previously mentioned. As an "all round" developer it excels anything I have ever used, and is equally good for negatives or positives. It works with sufficient slowness to admit of the finest detail being obtained, and gives the most beautiful, clear shadows and brilliant high lights. It seems almost impossible to fog a plate in development when this mixture is used, and I have carried on development for a half hour, and until the back of the plate was almost as dark as the front, and yet, after washing and fixing, the negative or positive would be very dense, of course, but still very clear and brilliant.

The formula I have used is a slight modification of that recommended by Mr. Cassebaum, and is as follows:

No. 1.	Hydroxylamine chloride	30 grains.
	Pyrogallol	240 "
	Water	1 pint.

No. 2.	Sodium carbonate, crystals	1 $\frac{1}{2}$ troy ounces.
	Sodium sulphite	4 $\frac{1}{2}$ " "
	Water	1 pint.

To develop take of No. 1, from one to two fluid ounces, No. 2, one-half fluid ounce, water four fluid ounces, flow over the plate, and if the image does not appear within 30 to 40 seconds, add more of No. 2 solution, in small portions at a time, until development commences. This is only offered as a general outline of the method of development, for each plate must form a study by itself, according to character of subject, time of exposure, etc., and the above proportions varied accordingly. No iron-clad system can be laid down for this.

The use of the sodium sulphite in this formula seems to be mainly in preventing the discoloration of the liquid during development. It may also act as a slight retarder of the chemical action, but such action is very slight. It does, however, materially affect the color of the liquid, for when a solution of the sodium carbonate alone is added to the pyro mixture, the liquid darkens very rapidly, much more so than when the sulphite is also used. With the latter mixture I have developed a dozen lantern slides, using the same developer for all, and after the last plate was finished the developer was but of a moderately light orange color. The mixture of the pyro and hydroxylamine chloride seems to possess remarkable keeping qualities. This bottle which I now show you contains a mixture made up two months ago, and as you see it is not as yet very dark, although it has been exposed to a strong light, and is, as I found out by testing it to-day, fully as active as when it was first made up. I am inclined to think, although as yet I have not had the opportunity of practically testing it, that the mixture will keep still better if the sodium sulphate is mixed with the pyro and hydroxylamine salt, instead of being added to the sodium carbonate. I shall try this combination shortly, and report its results to the Society at some future time. A point here which I wish to make in regard to keeping not only this but all other pyro mixtures, is the use of amber glass bottles and rubber corks, instead of the ordinary white flint bottle with a wooden cork. The amber glass prevents the actinic rays of light from penetrating to the contents of the bottle, and the rubber stopper is much superior to the woody cork, which soon blackens, rots, and contaminates the liquid which it confines.

A few months ago I had the pleasure of calling the attention of the members of this Society to a method of silver printing on plain paper, by which very beautiful results could be obtained. To attain the best results, a negative is needed which possesses considerable "snap," as it is technically termed, and this pyro and hydroxylamine developer produces the best negative for making the prints of any developer that I have yet used. The contrasts of light and shade are beautifully brought out, and while perfectly clear, are still soft and pleasing.

In conclusion, as "the proof of the pudding is in the eating of it," I beg leave to submit for the inspection of the members this evening, several negatives made with this developer, a series of plain silver prints made from them, and also a number of lantern slides developed with hydroxylamine and pyro. These will illustrate in the most practical way the character of work which this new developer is capable of, and I trust may serve to interest other members in still further "developing" the merits and uses of this valuable agent. One series represents a negative and a lantern slide from the negative, both developed with the same combination of hydroxylamine and pyro. I also show a lantern slide of the same subject prepared with a hydroquinone developer for purpose of comparison.

CHARLES L. MITCHELL, M. D.

CROOKES' "radiometer" is being used in France for timing the exposure of photographic plates, an equal number of revolutions of the vanes of this little instrument corresponding to the proper time of exposure, whatever the degree of brightness of the light.

ON INCREASING AND REDUCING DENSITY IN GELATINE NEGATIVES.

Presented at the meeting of the Society of Amateur Photographers of New York, June 12th, 1888.

THERE are so many variables in the problem of successful development, that surely there can be no compromise of one's reputation by a candid avowal of a liability to err at times in judging of the proper density of a gelatine negative before fixing.

The personal equation may lead one to fall to either side of the line of photographic perfection. The deflection it is true may be only slight, but the consequent lack of vigor or loss of half tones on the negative, after emerging from the hypo bath, naturally causes a regret for the failure to attain the proper limit of the development process. At such times recourse is gladly had to some of the methods for restoration of the lost virtues.

As a prophylactic some have recommended a kind of inoculation of the negative, giving it the very disease dreaded,—carrying the intensification in the development to a degree considerably beyond the known point of proper strength, and then resorting to a process of reduction, after fixing it, to obtain the intensity required. But such a plan is wrong in principle; intensification and reduction should be employed only as remedial agents. However, we have found that the *similia similibus curantur* plan may be advantageously pursued with intensification after fixing.

Of all the methods of intensification perhaps mercury followed by ammonia is most generally employed, but by the method usually followed we are obliged to take whatever degree of strength the mercury may give, so that frequently the negative is made too dense to yield good prints.

The following modification will enable the operator to check the degree of intensification when the proper gradations are obtained. The negative is first immersed in a preliminary reducing bath composed of

Per-chloride of iron (cryst.)	120 grains.
Citric acid	240 "
Water	32 oz.

the object of which is to thoroughly clear up the shadows, and to remove any slight traces of fog which, if allowed to remain, would go on increasing, with the intensification, and the last state of that negative would be worse than the first.

The negative is allowed to remain only a few minutes in the bath, which, as we have said, is a powerful reducer, and would totally obliterate the image if the action were long continued. • The solution of per-chloride should be rather weak; perhaps it might be better to recommend 50 ounces of water to the above proportions. On removal from the reducing solution the negative is well washed under a tap, then transferred to the bi-chloride of mercury solution, which may be of any strength from 10 per cent. to saturation. The bi-chloride is difficult to dissolve; a little chloride of ammonium is often added to facilitate solution.

After the film is well bleached it is again thoroughly washed, and placed in a bath of ammonia and water. 1 dr. of ammonia to 4 or 5 ounces of water is quite strong enough. Should the negative now be found to have attained to too great strength, all that is necessary to reduce its obduracy is to reimmerse it in the per-

chloride of iron and citric acid solution, and to watch until the gradations of light and shadows are properly represented.

The resultant negative will be found to have greatly improved in appearance and to possess good printing qualities, and probably less liability to change than others mercurialized by the usual method; the per-chloride of iron destroying any trace of hypo which might be present in the film despite the best washing of the plate.

In all processes of intensification and reduction, the chief aim should be to preserve the relation between the lights and the shadows in the negative.

It frequently happens that a method of intensification, though vigorous, operates unequally upon the film, giving the allopathic dose to the high lights, and the homeopathic to the shadows, just where strength is most needed. A negative so intensified may be relieved of its former flatness, but the hardness produced is even more objectionable.

To secure by intensification all the fine but latent gradations which the exposure has impressed upon the film, or in other words to produce an equilibrium of light and shade, the plan of intensification which Mr. John Cassebaum and myself proposed more than a year ago will be found most admirable.

No method known excels in simplicity the Silver method, but hitherto the great drawback to its employment with gelatine negatives has been, not only the liability to stain the film, but also the tendency to fog the negative.

Its action must be controlled by a previous operation upon the plate, and here comes in the favorable influence of the per-chloride of iron solution in preventing both stain and fog.

A thorough fixing and total elimination of the hypo from the film is absolutely essential if any success is expected with silver intensification.

Per-chloride of iron here comes to our aid, destroying any last trace of this persistent salt.

The negative to be intensified is placed in a bath composed of

Per-chloride of iron,	4 grs.
Citric acid,	4 grs.
Water,	1 oz.

In warm weather 2 grs. of chrome alum should be added to prevent frilling, but we would rather dispense with it when possible. The plate when in the iron should be kept in motion to secure evenness of deposit.

A few minutes is sufficient to clear up the negative, after which it is thoroughly washed, and subjected to the gallic acid and silver bath, which, having a substructure of chloride to work on, builds up rapidly and evenly, or rather, we should say, the effect of its action is more visible in the weaker parts of the negative, owing to the deposit of the per-chloride of iron acting upon the whole of the film.

Eighty grs. of gallic acid are dissolved in one oz. of alcohol, and the solution kept until all turbidity subsides.

Glycerine may be substituted for the alcohol. Care must be taken to secure a good quality of gallic acid, as upon its purity everything depends.

Next 30 grs. of nitrate of silver are dissolved in 1 oz. of distilled water, and after a good sunning filtered from sediment.

To prepare the intensifier for immediate use take

Silver solution,	1 dr.
Gallic acid solution,	1 dr.
Water,	1 oz.

Place the negative which has been subjected to the iron solution in a scrupulously clean dish (glass is preferable to rubber), and pour over it the intensifier, keeping the dish in gentle motion to insure uniformity of action on the film.

The negative will tone up gradually. When the desired degree of intensity is secured, the plate is thoroughly washed, and finally dipped in weak hypo solution; again washed, and the operation is complete. The intensity should not be carried too far, because on drying the strength will be found to be greater than it appeared in the wet film. However, the power of the reducer is at hand. All that is necessary is to place it in the per-chloride of iron solution until the proper degree is restored.

Should a slight opalescence appear upon the surface of the film on placing the negative in the silver, it is an indication of insufficient washing from the iron bath. It is not serious, however, and may be generally rubbed off with a piece of wet cotton, and will disappear entirely in the hypo.

The negative should not lie too long in the per-chloride solution, as the action is best when confined to the surface of the film.

This method of intensification with silver is not a mere staining of the film with an adactinic color, but a genuine building up of the image, a superposition of a new image upon the basis of the old one.

It has been in use now for more than a year, and in the hands of careful and cleanly manipulators has given great satisfaction. As to the keeping qualities of the negative so intensified, we shall simply say we have exposed samples to a strong northern light for nearly twelve months without finding any signs of deterioration.

A word, in conclusion, about dense negatives.

There is a peculiarity of gelatine plates which makes them a favorite with me; that is, the extraordinary softness obtained with slight over-exposure, and the wealth of detail in the deep shadows; sometimes, it is true, almost latent, yet capable of being brought forth by judicious treatment.

True, the softness may sometimes degenerate into flatness, but I would be inclined to err rather on the side of softness than in the direction of harshness.

In developing a fully-timed plate, we notice that high lights come up first, then the middle tones, and lastly, the deep shadows. The high lights, therefore, as a matter of course, have a deeper deposit than the feebler illuminated portions. Sometimes the contrast between the high lights and the deep shadows is too great, and we feel anxious to apportion the deposit more fairly. We have recourse to reducing agents, but here we must exercise care.

A chemical which acts uniformly upon the high lights and shadows would not much improve the condition of things; the shadows would go altogether while the high lights were reducing.

A very weak solution of per-chloride of iron acts first upon the high lights, without affecting the finer details of the shadows.

The best plan is to immerse the negative in a weak solution,

Per-chloride of iron,	30 grs.
Citric acid,	60 "
Water,	1 pint

for a minute or two, then wash and pass rapidly through hypo solution, ordinary strength. Be careful not to let the plate remain in the hypo more than a few seconds, as the reduction is very rapid.

The operation may be repeated as often as is necessary, so that the exact degree can be obtained, and the operation stopped at once.

If a strong solution of iron is used, the shadows suffer, the action taking place uniformly on the whole film; but, if a weak solution is employed, the high lights are attacked first. So that really, if judiciously used, the per-chloride of iron may be made to improve the flatness of a badly developed negative, if used strong giving it more brilliancy by making a greater contrast between the lights and shadows.

JOHN BARTLETT.

THE REPRODUCTION OF NEGATIVES.

Read before the Photographic Society of Philadelphia, June 6th.

COMPARATIVELY few photographers seem to appreciate the value to be derived from the successful working of a process for the reproduction of negatives. Many believe a reproduction cannot be made to equal the original. My experience has satisfied me that with care and judgment negatives can be made from others that are as good, and, in some cases, better than the original.

Supposing a rare and valuable negative is on thin glass, and needs a large number of prints made from it, and the owner will not risk the only negative he has. Neither can an edition be made ready in time for a publication. Again, a negative is too thin and flat—made in bad weather—is full of detail, but lacks brilliancy, would not care to risk an intensifier, bearing in mind the stains that may result, besides which intensifying would not make it any more brilliant. This can be reproduced and a brilliant negative result. A small negative is to be enlarged, or a valuable negative is broken and cannot be made again. Even this can be successfully reproduced.

At different times a knowledge of how to make a negative from a negative has been of great value to me. In 1881 and 1882, during a six months sojourn in the Orient, I duplicated all subjects made while in Egypt, but on reaching Arabia and Palestine, plates were getting scarce, and only one plate was used on each subject. Many exposures were made under unfavorable conditions in rain, cloudy weather, etc., as an itinerary had been mapped out, and a certain amount of country had to be gone over each day, and views had to be made under all conditions, good and bad.

Nearly all of these I reproduced on my return, and will show you to-night some of the results, with a print from the original plate and one from the reproduction, side by side. Only recently I came into control of a large collection of plates of India, some of which were made high up in the Himalayas, many miles from a railroad, where travel is expensive and difficult. A few of the choicest plates were cracked and broken. Some of these which had no chipped edges, but were broken clean, I have reproduced. Sometimes a reversed negative of a choice subject is wanted for some photo-mechanical process.

Having briefly outlined where reproduction was a help and a necessity, we will take up the first part of the process, that is, the making of the positive. Having carefully studied the character of the negative, its color, unevennesses, dense portions,

etc., carefully clean the back, and have ready a deep printing frame, a size larger than the negative. Have in this a piece of crystal plate glass, free from bubbles and scratches. Then arrange the negatives in the centre of the frame, being careful to brush away with a blender all filaments and grit, and place the plates to be used for the positive face down in contact with the negatives. Place a dark pad on this, and put in the back, and gently press the springs into position. All is now ready for the exposure, which I have always made with a Carbutt lantern, measuring about eighteen inches from the side of the lantern, and making a mark, using the oil lamp, as I found this the most regular and reliable, as it can be turned up to nearly the same brilliancy each time of using. The time of exposure varies of course with the density of the negatives and the rapidity of the plate used. I prefer using a slow plate for the positive, one that will develop with ferrous oxalate, such as Carbutt's *A* or *B* plates, unless a very dense negative is to be reproduced. I have used recently on dense negatives some Belgian plates that were rapid, also a few Seeds, 22 to 25, as they develop a fine gray color with the ferrous oxalate. I also prefer using a plate a size larger than the negative, in this way avoiding thin edges. Should the negatives be of average good density, about 30 to 40 seconds will be the right exposure with an *A* plate. If one end of the negatives is thin, shade this by moving between it and the light a cardboard, cut to suit the unevenness. If certain portions of the centre are dense, cut a round hole in a cardboard, and move this in front of the plate and the dense portions, and keep it in motion, giving the necessary extra exposure to bring up the detail which might otherwise be lost.

Having properly exposed the plate, mix a developer, consisting of 8 parts of oxalate of potash (saturated) solution to 1 part of iron (also saturated), and 20 drops of a 20-gr. solution of bromide of potassium. The image will, of course, appear slowly, but will build up with an evenness that is essential to success; this should be continued until the image is entirely covered, even the highest lights, so that all detail in every portion of the plate is brought out, then wash and fix as usual.

The weak developer well restrained gives a soft, even, gray image, full of detail, without too much vigor. In case a thin, flat negative is used, use an *A* plate, and place the frame 36 inches from the light, and expose proportionately double what it would be at 18 inches, and get as much brilliancy as possible in the development; sometimes, when the original is very flat, ending with a developer consisting of oxalate of potash 4 parts, iron 1 part, which will give it snap and vigor. Should it be the intention to enlarge the resulting negative, the positive for this purpose should be less dense than for contact use.

Having dried the positive, carefully spot out any pinholes with a fine pointed brush, and do any other retouching the picture may need, such as strengthening dark portions, etc. Any scraping away of objects not wanted should be done on the positive, such as a crack from a broken negative.

I have with me a positive made from a broken negative, which was in three pieces, and one corner entirely gone, broken en route from India. I carefully laid the pieces together in a printing frame and brought them in close contact, then placed the plate, a size larger than the negative, in position, and during the exposure moved the frame slowly from side to side in front of the light, to lessen any shadow which might be thrown by the crack. I placed this positive in the hands of Mr. H. Parker

Rolfe, a member of this society, who has obliterated the cracks, removed a cow which had strayed in on the edge of the picture, and filled in the corner, which was a blank.

The making of the negative is next in order, and I proceed to make the exposure the same as in the positive, supposing the negative is to be the same size, and used for silver printing and ordinary purposes. Should the reproduction be wanted for use in phototyping, photogravure, or any of the processes requiring a reversed negative, then the negative must be made in the camera, placing the positive in position with the film side turned from the lens. Where enlarged negatives are intended, they must be made in the camera, with a short focus rectilinear lens, or a camera with a very long draw. Experience alone will give you the proper time of exposure. It will vary with the density of the positive, and the rapidity of the plate used. Here, as before, in making the positive, judgment should be used in measuring the distance from the frame to the light, as a dense positive can be brought to 15 inches, and a very thin one as much as 36 inches, from the light. In this part of the process I use pyro developer in preference to oxalate, although the Oriental subjects which I will show are all made, both positives and negatives, with ferrous oxalate on Carbutt's *A* plates. But I find since making them, a better knowledge of development has been gained, and the results with pyro are surer than with iron.

I generally begin the development as if the plate were overtimed, using a weak soda and pyro, with a trifle of bromide, and adding soda or pyro as the subject and conditions may suggest. The development is similar to that of an ordinary exposure made in the camera. One must notice the detail, the general appearance and progress, the same, if the result is to equal an original negative. I have found that the most difficult part in the process is to secure a positive of the proper density and color. It must be rather over-exposed, and gray in color, with all detail apparent without straining the eyes to see it. I always judge the density by daylight, and never use a positive that is yellow, as it is very deceiving in its density, and usually gives an unsatisfactory result. While I admit there are negatives that cannot be well reproduced, I believe they are the exception and not the rule. Hardness or chalkiness is likely to occur to the beginner, as he is apt to make the positive brilliant in all cases, when really this is not necessary, excepting where a weak, flat negative is used.

Cleanliness, freedom from dust, and good judgment, combined with skill in development, are necessary to obtain the best results.

WM. H. RAU.

EFFLUVIOGRAPHY.—This name has been applied by M. D. Tomasi to the effects produced by the silent discharge upon a sensitized gelatino-bromide plate. After an exposure of some minutes' duration, an image may be obtained from an electrified body, although (if we understand the author aright) the potential may not be high enough to give any sign of light, and when all other light is excluded. The image may be developed in the usual manner. M. Tomasi considers that the silent discharge produces the same effect as the ultra-violet rays, and may form a connecting link between the two extremes of the spectrum, consisting of what may be called "electric rays."—*Electric World*.

THE ORIGIN AND TECHNOLOGY OF PHOTOGRAPHIC CHEMICALS.

Fourteenth Paper.—Muriate of Hydroxylamine.

A MONG the most recent additions to the photographic developers is the muriate or chloride of hydroxylamine, essentially a scientific creation, resulting from working out the theory of chemical composition of water. In old-fashioned chemistry water was described as containing oxygen and hydrogen in equal equivalents, but owing to the evolution of concrete theories of the newer chemistry it is found necessary to give chemical formulas to bodies in accordance with the atomic weights or volume of their equivalent components. Therefore water, although composed of one equivalent of hydrogen and one of oxygen, actually contains two volumes of hydrogen in combination with one volume of oxygen, and the chemical formula is given as OH_2 instead of the old one OH. To elucidate this fully is impossible in our limited space, but the fact accepted will aid one to comprehend this interesting substance, hydroxylamine, of which so much is spoken in photography just now.

In organic compounds innumerable new bodies can be produced by substituting for parts of the combined hydrogen, other gases or substances of most complex nature. We have in hydroxylamine an example of this sort. Water is HOH (OH_2), and by complicated chemical reaction, one of the hydrogen atoms is removed and replaced by the radical of ammonia, thus forming instead of HOH , the new compound NH_2O . It was discovered by W. Lossen, in 1865, by the reduction of nitric ether by tin and muriatic acid, and has been made since then by similar reaction on nitric acid, nitric salts, nitrous acid and its salts, also by the action of sulphurous acid, sulphuretted hydrogen, etc., on nitric acid, and by innumerable other chemical mixtures.

To prepare it, put in a large flask 120 parts nitric ether, 400 parts granulated tin, 800 to 1000 parts muriatic acid, and 3000 parts of water, and without warming let the chemical reaction go on, simply stirring occasionally. The product of reduction is diluted with water, the dissolved tin salt is precipitated with sulphuretted hydrogen, and chloride of ammonium and double salts of tin remaining, then crystallize out, and the residual solution containing muriate of ammonia and chloride of hydroxylamine is concentrated, and the mixed resulting crystals, washed with alcohol and absolute alcohol; separating the chloride of ammonium with chloride of platinum. From the remaining solution, precipitates crystalline chloride of hydroxylamine.

Hydroxylamine is odorless in aqueous solution, and entirely volatile by distillation, though partially decomposed into ammonia. It is a base, and has alkaline reaction, and the alcoholic solution is irritating and painful to the skin. This base hydroxylamine combines with almost all acids, possibly carbonic acid excepted, and therefore, in our photographic nomenclature, it should be thought of not as a salt, the chloride being the substance used in developing. The base is not permanent, while the salts can be preserved.

Hydroxylamine does not precipitate alkaline earth salts, but has a very pronounced reducing action in solutions of the heavy metals. By oxydising substances it is easily decomposed into water, nitrous oxide and nitrogen, and therefore is a very powerful agent in reducing gold and silver salts, and hence its value in photography. In consequence of the intense affinity for oxidising substances it can be determined by volumetric analysis in several complex methods.

The salts of hydroxylamine result from its combination direct with acids, they are mostly soluble in water and alcohol, and crystallize without water of crystallization. By warmth these salts are apt to decompose with a sudden stormy evolution of various gases. The hydrate or caustic soda as well as carbonate of soda set free hydroxylamine, but an excess of either will cause decomposition into complex bodies. Therefore, doubtless, the original formulas with caustic soda gave so much trouble in many photographic experiments.

Chloride of hydroxylamine crystallizes in long prisms if suffered to cool slowly from a hot saturated alcoholic solution and also in plates resembling nitrate of silver in appearance, which melt at 151° Cent, and rapidly decompose into water, muriatic acid and chloride of ammonia. They dissolve readily in water, with a strong reduction of temperature. There are three combinations with chlorine, neutral to NH_3ONCl , $\frac{2}{3}$ salt, $(\text{NH}_3\text{O})_3$, $(\text{HCl})_2$ and a basic salt of $(\text{NH}_3\text{O})_2 \text{HCl}$.

Alone hydroxylamine has not given satisfactory results as a developer, but Cassebaum has given a method of combining it with pyrogallic acid that is highly commended by Dr. C. L. Mitchell, of the Photographic Society of Philadelphia, whose paper, to be read at the meeting of that body in June, 1888, will no doubt prove most interesting, and whose methods can be tried with confidence. In the "*Photographischer Beobachter*" of May, 1888, Dr. Von Konkoly gives an article on the troubles of using chloride of hydroxylamine as a developer. He says it has the great disadvantage of producing pronounced blisters on gelatine plates, owing to the ready decomposition into gaseous constituents. He describes most elaborately the methods used to capture these gases, and investigated them most thoroughly. He says 3 grammes of gelatine treated with 9 c. c. hydroxylamine and caustic soda gave 13 c. c. of gas in a half-hour, showing the decomposition was very thorough. He gives the possible decomposition in the following scheme:

$\text{AgBr} + 2\text{Na}[\text{OH}] + [\text{H}_2\text{OHN}]$ (hydroxylamine) + HCl , equals

$\text{Ag} + \text{NaCl} + \text{NaBr} + 3\text{H}_2\text{O} + \text{N}$,

and that the gas evolved is nitrogen, with possible traces of others.

As the chemistry of hydroxylamine is a source of great satisfaction and interest to accomplished chemists, this faint effort in a small space to elucidate it must be received as very imperfect and superficial, having been written merely to induce photographic workers to take interest in the new substance employed in photographic manipulations.

FRANK H. ROSENGARTEN.

CRITIQUE OF WORK OF THE PHOTOGRAPHIC SOCIETY ON PHILA.

IN the rooms of the Photographic Society of Philadelphia, 1305 Arch street, the annual exhibition of its members' work is now being held. While it is not so large as might be desired, there is a notable display of the progress photography has been making towards the picturesque, which, not many years ago, was little more than dreamed of, but is now a pleasant reality.

There is considerable variety offered in the exhibition, both as regards subjects and the methods employed. Among the photographs shown are four prize pictures from the recent Boston exhibition. They are "The Day Before Christmas," and

"Driving Sheep," by George B. Wood; "Ready for the Dance," by Henry Harrison Suplee, and a frame containing instantaneous views of jumpers, hurdle racers, etc., by David Pepper.

It is possible that there is but little division of opinion in the choice of the gems of the exhibition, contained in the frame labeled with an improvement on the old nursery rhyme, "There was a young woman, and what do you think, she lived upon nothing but victuals and drink." The difference between this and the old song consists in substituting "young" for "old." The pictures show a wee little girl, such as Sir John Millais loves to paint, with long flowing hair, and dressed in a cute "Mother Hubbard," sitting before a bountifully set table.

In one picture, the little one eyes the spectator coyly as she puts a spoon in her mouth, and in the other, her pretty little countenance is lost sight of behind a huge silver mug from which she drinks. They are really artistic in conception, and the skill with which they are composed makes them doubly so. These are the work of Robert Stuart Redfield, who has a number of other clever photographs, which are beautiful specimens of clean, clear prints, with much attention to details.

George B. Wood's part of the exhibition, and it is not a small part, is equal to his previous work in this direction. He takes in a wide range of subjects, amusing *genres*, animals, landscapes, etc. Probably the most artistic of these are the North Atlantic Squadron firing a salute in the Delaware river, and a rainy day on a country road, both of which are effective compositions, and full of atmosphere.

Of the photographs shown by John Bartlett, the flower, fruit and still-life studies are the most interesting from a picturesque point of view, though from a technical standpoint his figure compositions are valuable proofs of what can be obtained by the "flash light" process. H. H. Suplee shows some pretty and original poses in a number of interesting three-quarter lengths, and a pair of wild ducks hanging up, by S. Fisher Corlies, makes an agreeable picture of a somewhat hackneyed subject. David Pepper, Jr., exhibits a frame of foreign views taken with a "detective" camera.

Of the specimens shown by Edmund Stirling, possibly the prettiest is a view of an old mill dam on the Brandywine, which is a good photograph of a well-chosen and picturesque scene. Dr. C. L. Mitchell shows a number of interesting landscapes and cascades.

Taken as a whole, the exhibition may be considered as a successful one, and displaying much promise for the future of this comparatively new art.—*Phila. Public Ledger.*⁴

LARGE BLUE PRINTS.

THE writer has, on an earlier occasion, presented to the Society, with the kind permission of Professor E. C. Cleaves, samples of blue prints of extraordinary size, as made by a method, and with apparatus, original, it is believed, with that gentleman. That exhibited at the Washington meeting of this Society, and a similar one exhibited at the Kaaterskill meeting of the Civil Engineers, were 8 feet long and $3\frac{1}{2}$ feet in width. It will be remembered that they were made on a revolving cylinder, contact being secured simply by drawing the tracing tight over the

sensitive paper and the underlying felt by means of suitably arranged clamps and springs. No glass was needed, and the expense and risk, and something of the trouble, of the common method of operation was thus avoided.*

The writer has since had some still larger prints prepared by a still simpler apparatus and method, original with himself, and by which an almost unlimited area of surface may be printed. The blue print accompanying this paper is a sample of what may be done in any drawing-room in which light can be obtained for such extent of print. It is a blue print from a tracing of one of Captain Zalinski's latest forms of pneumatic dynamite gun shells, as designed by him for the fifteen-inch gun now under construction. The print is 14 feet long and $2\frac{1}{2}$ feet wide. It is a good sample of the fine work in printing and toning which is done by Professor Cleaves for the Sibley College of Cornell University. The formulas for the reagents are derived by a systematic course of experimental investigation directed to that end some time since.

The printing apparatus used for this latter work consists of nothing but a single thin board, of the length and breadth of the proposed print, with some margin for the stretching clamps. This board is covered with good felt of carefully selected quality, securely and smoothly fastened to the board by any convenient means. A line of tacks does as well, perhaps, as anything. The sensitive paper is then stretched over the felt, and the tracing drawn over that, and both are smoothly stretched by clamps or other convenient device. It is of course evident that it would not be practicable by this operation simply to obtain that complete contact and pressure throughout the surface in contact that is required for good work; but this desideratum is easily secured by the simplest expedient imaginable: the board is merely sprung to a flat arc in the direction either of its length or its breadth, ordinarily in its longer line. This brings everything "taut," and the printing is done precisely as under glass, with the further decided advantage that no light is lost through the intervention of the glass; which, however excellent in quality, will inevitably absorb a very measurable amount.

The accompanying sketch represents the apparatus designed by Professor Cleaves for the purpose of carrying into effect the suggestion of the writer in the making of the very large prints of which that presented herewith is a sample. Figures 103 and 104 are a plan and side elevation of the board and its mounting. It will be seen that the upper, or printing board, is supported upon a lower and somewhat narrower and longer one, which, in turn, should be carried on trestles or other convenient arrangement. The printing board is stiffened laterally by strips or battens, but is free to spring longitudinally to any desired extent. The supporting board is stiffened longitudinally. At each end of the latter is a batten *d d*, set transversely, which answers as a chock, as seen later. Clamps *c c* are placed at either end of the printing board by means of which to secure the felt, paper, and tracing. One or both of these clamps may be made adjustable for varying lengths of print. Figures 105 and 106 show the method of operation. The board is first raised at one end and thus slightly sprung. The felt and paper and the tracing which forms the negative, are stretched smoothly between the clamps and well secured. The board is next laid down on the supporting base, the two ends made fast, the one to the batten at the left, the other to another arranged at the proper

* Trans. A. S. M. E., Vol. VIII., p. 722.

distance from the right hand extremity, the printing board springing into a curve of which the bridge *a*, hinged at the middle, as in *A*, and thrown up, as seen in the sketch *B*, gives the versed sine. By springing to any desirable extent, as in *A*, and then reversing the curve, as in *B*, any required degree of tension and stretch can be given the tracing, and thus any necessary amount of pressure and perfection of

Fig. 103

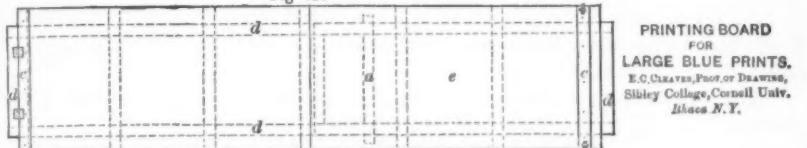


Fig. 104



Fig. 105

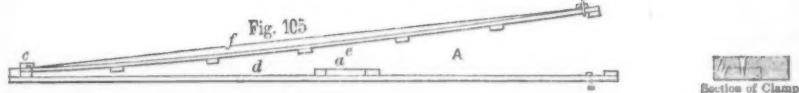
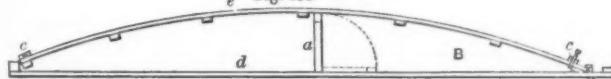


Fig. 106



contact with the sensitive paper may be obtained. The two sections at the right exhibit the end view of the pair of boards and a section of the clamp used.

It is obvious that this scheme will suffice to print any area of blue-print that paper can be obtained to cover—a half-mile square if necessary. The amount of springing required is very small, and never enough to affect perceptibly the uniformity of the printing and tone of the print. If it should ever seem too great, it is easy to correct the defect by first springing the board in the reverse direction; then, after drawing the covering felt and papers tight, bending it in the first proposed direction, past the straight line, and as far as may be found desirable to secure good contact. We have found this method to work quite as well as the cylinder; which we still use, however, for what we now call *small* sizes. Perhaps this may be as well or better than the new method, up to eight or ten feet length, and for narrow prints; while the new arrangement may do best whenever extraordinary sizes—as gauged by our new standard—are called for.

(From *Advance Sheets*, Vol. IX., *Transactions A. S. M. E.*,
Nashville Meeting, 1888.)

R. H. THURSTON.

Ithaca, N. Y.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held Wednesday evening, June 6th, 1888, with the President, Mr. Frederic Graff, in the chair.

The Secretary read a letter from Mr. William Garrison Reed, of Boston, Mass., presenting to the Society four photographs of the gallery of the Boston Art Club during the recent joint exhibition.

Also one from Mons. M. Beck, of Paris, presenting a copy of his treatise on Retouching Photographic Negatives. Both donations were accepted with a vote of thanks.

The Committee on Membership reported the election of the following active members: Mr. Albert B. Parvin and Dr. William B. Van Lennep.

The Committee on Presentation Pictures reported the selection of "A New England Watering Place," by Robert S. Redfield, as one of the Presentation Pictures for 1888. Decision as to the other picture was reserved until the next meeting.

Papers were read by Mr. William H. Rau, "On the Reproduction of Negatives," and by Dr. C. L. Mitchell, "On a New Developer—Hydroxylamine and Pyro."

The following communication from Mr. Frederick E. Ives was read by the Secretary:

"Chlorophyl and cyanin isochromatic plates do not keep well, and the more color-sensitive they are made, the sooner they spoil. I found reason to believe that the deterioration of the plates was due to exposure of the sensitive surface to the air, and tried dipping the newly prepared plates in a thin solution of gelatine, in order to give the sensitive surface a protective coating. The experiment was a success. Plates prepared with cyanin, according to my new method, and then dipped in the gelatine solution before drying, worked perfectly clear long after the unprotected plates gave only a mass of fog. It is therefore possible to produce perfect keeping plates which are more sensitive to orange-red than the best commercial orthochromatic plates are to yellow."

A communication was received from Mr. Edward Tilghman, calling attention to a report of a meeting of this Society, held over twenty years ago, as follows:

"Minutes of a meeting of the Photographic Society of Philadelphia, held October 9th, 1867. Mr. Edward Tilghman offered on behalf of Mr. Samuel Powel, of Newport, Rhode Island, a corresponding member of the Society, a photograph showing the power of actinism to make manifest objects which are invisible to the eye. A band of blue mouseline de laine, covering a checked dress so as to conceal the pattern underneath, was unable to prevent the latter from impressing the negative. The check consequently became visible in the photograph."

Mr. Tilghman claimed that this mention of the power of actinism was the first record of this wonderful capability of the photographic plate, and that credit should be given provisionally to Mr. Powel.

A photograph was shown to illustrate the subject that had been made and exhibited at the meeting mentioned.

A letter which had been received by the President from Bt.-Col. A. C. M. Pennington, U. S. A., in charge of the Department of Photography of the United States Artillery School, at Fortress Monroe, Va., was read as follows:

UNITED STATES ARTILLERY SCHOOL.

Department of Photography.

Fortress Monroe, Va., May 27th, 1888.

MY DEAR SIR:

I notice in a report of a meeting of the Photographic Society of Philadelphia, some remarks on intensification of gelatine plates. I send you an intensifier which we have used here for over two years. Plates intensified as long ago as that show no signs of change. If the hypo is thoroughly eradicated and the plate soaked over night, I find that it gives better results than any intensifier we have tried—and we have used great many. If a plate has been thoroughly dried and then soaked, the longer it has been dried the better, the more satisfactory the result. Will you give it to some of the members to try? I should be pleased to hear of the result of their trials. I have never seen it spoken of in any of the journals., and, as far as I know, it is original with us.

Yours truly,

A. C. M. PENNINGTON, Bt.-Col., U. S. A.

In Charge.

FORTRESS MONROE INTENSIFIER.

No. 1.

Corrosive sublimate,	4 ounces.
Common salt,	4 "
Water,	2 quarts.

No. 2.

Ammonia, concentrated,	1 ounce.
Water,	20 ounces.

Immerse plate in No. 1 until sufficient intensity is obtained, and plate is bleached thoroughly; wash well, and immerse in No. 2 until dark color strikes through to back of plate. Repeat if necessary.

Mr. Carbutt stated that the peculiarity of this formula seemed to consist in the substitution of chloride of sodium for chloride of ammonium, as generally used. The object of the use of these salts was to aid in dissolving the bi-chloride of mercury.

Mr. Carbutt showed a negative made on a slow gelatine plate especially prepared for photo-mechanical work, in which some printed matter had been reproduced in perfectly clear lines on an intensely black ground. The plates seemed admirably adapted for this purpose.

Mr. Redfield showed two prints representing the interior of the meeting-room of the Society. One was made on a Seed 25-plate, and one on a Carbutt ortho-chromatic 20-plate without color screen. The details in the oak furniture and woodwork, and in the darker portions of the room, whose general tone is yellow or brown, were brought out in a noticeable manner in the orthochromatic plate.

Mr. Carbutt also showed prints from orthochromatic negatives of the University building and a plot of brilliantly colored flowers in the University grounds.

Mr. Burroughs showed three negatives exposed under exactly similar conditions, and for same length of time, but developed one with hydroquinone, one with hydroxylamine and pyro, and one with pyro and soda as usual. The latter produced the best negative, though, perhaps, better results with the other developers might have been obtained, with some variations in the proportions of ingredients.

Mr. George B. Wood showed some silver prints made on ordinary postal cards.

The cards were floated on the bath in the usual manner with albumen paper, without preparation of any kind, and produced very fair results.

He also spoke of a means of focusing in case of breaking the groundglass of the camera. If a focusing glass was placed upon one of the broken pieces of ground glass left in the frame an accurate focus for the plate could readily be obtained.

He had obtained a perfect print from a cracked negative by suspending the negative from a sky-light, face of printing frame down, within six inches of the floor. The process is slow but sure, requiring about an entire day to make the print.

Adjourned.

ROBERT S. REDFIELD,

Secretary.

MINNEAPOLIS CONVENTION.

EXPOSITION BUILDING, July 10th to 14th, 1889.

RAILROAD INFORMATION.

ALL the passenger associations in the United States have granted the rate of a fare and a third for round trip to our convention, upon the following conditions:

FIRST. Each person desiring the excursion rate must purchase a first-class ticket (either limited or unlimited), to the place of meeting, for which he will pay the regular fare; and upon request, the ticket agent will issue a printed certificate of purchase of the general form, as shown in this circular.

SECOND. If through tickets cannot be procured at the starting point, parties will purchase to the most convenient point where such through tickets can be obtained, and repurchase through to place of meeting, requesting a certificate from the ticket agent at the point where repurchase is made.

THIRD. Tickets for the return journey will be sold by the ticket agents at the place of meeting, at one-third the highest limited fare, only to those holding certificates signed by the ticket agent at point where through ticket to place of meeting was purchased, and countersigned by the Secretary or Clerk of the Association, certifying that the holder has been in regular attendance at the meeting.

FOURTH. It is very important that a certificate be procured, as it will indicate that full fare has been paid for the going journey, and that the purchaser is therefore entitled to the excursion fare returning. It will also determine the route via which the ticket for return journey should be issued.

FIFTH. Tickets for return journey will be furnished only on certificates procured not more than THREE DAYS before the meeting assembles, and will be available for continuous trips only, no stop-over privileges being allowed on tickets sold at less than full fares. Certificates will not be honored unless presented within THREE DAYS after the adjournment of the meeting.

SIXTH. Ticket agents will be instructed that the excursion fares will not be available for the return journey, unless the holders of certificates are properly identified, as provided for in the certificate, including the statement of the Secretary or Clerk that there have been in regular attendance not less than one hundred persons holding received certificates of the standard form.

SEVENTH. The certificates are not transferable, and the signature affixed at the starting point, compared with the signature to the receipt, will enable the ticket agent to detect any attempted transfer.

VERY IMPORTANT!

EIGHTH. You should be particular to notify every person desiring to secure the excursion rate, that the following rule will not be deviated from under any circumstances;

"No refund of fare will be made on any account whatever because of failure of the parties to obtain certificates."

You will observe from this rule that it will be absolutely necessary for each person to obtain a certificate from the agent where the ticket is purchased to the point where the convention is held, otherwise he will be unable to obtain the excursion rate returning, and will be obliged to pay full tariff fare both ways.

Now, while in a general way the above rate is the best procurable (the passenger agents having met, resolved and adjourned), still it is altogether probable that the great majority will be able to secure a rate of one fare for round trip. Make an effort to this end, join your neighbor and get up a competition between agents of different roads; interview the scalper, or buy a thousand mile ticket with rebate for unused portion. "Push Things!"

Be sure to purchase ticket to Minneapolis, and not St. Paul, which is ten miles away. Also see to it in time that your agent is supplied with certificates.

HOTEL RATES AND LOCATION.

WEST HOTEL, Headquarters.—\$2.50 per day, each, two or more in a room. \$3.00 per day, each, two or more in a room, with bath. \$3.00 per day, one in a room. \$3.50 per day, one in a room, with bath. Capacity, 1000 guests.

THE NICOLLET.—Regular Rates, \$2.50, \$3.00 and \$3.50. The Photographers, \$2.50 straight, best rooms. Capacity, 400.

NATIONAL HOTEL, 205 Washington Ave., South.—\$1.50 per day. Capacity, 70 rooms.

THE NEW ST. CHARLES, Cor. First Ave., South and Second Sts.—\$1.50 per day. Capacity, 40 rooms.

PAULY HOUSE, Opp. Union Depot.—\$1.50 per day. Capacity, 50 rooms.

FISHER HOTEL, Near Union Depot.—\$1.25 per day. Capacity, 90 rooms.

CLARK HOUSE, Corner Fourth Street and Hennepin Avenue.—\$1.50 per day. Capacity, 50 rooms.

ST. JAMES HOTEL, Corner Second Street and Washington Avenue.—\$1.75 single; \$1.50 double (two in a room). Capacity not given.

Besides innumerable other hostelleries the rates of which were so low that we were ashamed to ask a reduction.

We'll pit Minneapolis beefsteak, and especially its bread, against the world; and there's the ozone! which is without price, and yet priceless.

Go up and be refreshed!

W. H. POTTER,

Secretary.

INDIANAPOLIS, MAY 11, 1888.

PRIZES AT THE MINNEAPOLIS CONVENTION.

E. & H. T. Anthony & Co. offer the following cash prizes:

For the best collection of plain enlargements on Anthony's Reliable Bromide

Paper,	\$50 00
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For the best collection of crayon worked enlargements,	50 00
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" " " pastels " " "	25 00
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" " " ink or water colored "	25 00
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No collection of plain enlargements need exceed half a dozen.

Worked prints may be limited to two, or may be increased in number as the exhibitor may desire.

Exhibitors should notify E. & H. T. Anthony & Co. one month before the date of convention of their intention to compete, naming the class or classes they will exhibit in, and giving a private mark by which their exhibit shall be recognized after the awards by the judges, who shall be members of the association.

On such notification, E. & H. T. Anthony & Co. will return a circular of directions as to shipment, etc.

AIR BRUSH PRIZES.

One complete Air Brush for best portrait in black-and-white, finished with the Air Brush.

One complete Air Brush for the best portrait in water-colors, finished with Air Brush.

MCCOLLIN & CO.'S BLITZ-PULVER PRIZE.

With the intention of bringing to the notice of Photographers the value of their New Magnesium Light, Thomas H. McCollin & Co. offer \$50.00 in gold for the best photograph or set of photographs (any size) made with their Blitz-Pulver, which shall be on exhibition at the Minneapolis Exhibition, July 10-13. For particulars apply to Thos. H. McCollin & Co., 635 Arch St., Philadelphia.

EASTMAN PRIZES.

For the best collection of five or more plain enlargements on Eastman's permanent bromide paper, one \$100.00 silver cup.

For the best single plain enlargement on Eastman's permanent bromide paper, one \$50.00 gold badge.

For the best collection showing various applications of Transferotype paper, one \$50.00 gold medal.

THE BLAIR SILVER CUP PRIZE.

MR. J. W. WALMSLEY sends us an excellent photograph of a cat, taken at night with McCollin & Co.'s Blitz-pulver. The negative is fully timed, and the expression of the cat very feline. It was taken with a single charge of powder, and with the celebrated Beck lens.

As the duration of the flash is something less than one-tenth of a second, we need not say that the Beck lens is exceedingly rapid.

OF all the professions, that of stereopticon exhibitor is the most urgent in its demands for something new. Pictures, however beautiful, are apt to become stale and unprofitable when presented too often to the same spectators, and the exhibitor, in his swing around the circle, is constantly on the alert to pick up something novel, something strange, in the shape of a magic-lantern slide. We say he cannot do better than to secure a copy of the supplement to the catalogue issued by William H. Rau, of this city.

Mr. Rau has made numerous additions to his already large and varied collection. Many new localities are represented; places which we thought had escaped even the ubiquitous camera.

The new series of Indian views contains many rare subjects, such as glacier views, snow bridges, rattan bridges in the Himalayas, 16,000 feet above the sea level; the sacred caves of Amurnath, to which pilgrimages are made by the very devoted Hindoos, who sometimes perish in the attempt to reach them; portraits and groups of the natives at their different labors, etc., etc.

The photographs are from original negatives made by a resident during a long stay in the country, which enabled him to secure a most valuable and interesting collection.

A NEW EDITION OF THE AMATEUR PHOTOGRAPHER. By Ellerslie Wallace, Jr.
Porter & Coates, Philadelphia.

We are glad to see that this excellent book, by Dr. Wallace, is so appreciated as to demand another edition.

THE AMATEUR PHOTOGRAPHER is, in reality, a record of the practical experience of one who is thoroughly acquainted with the details of every subject treated of in its pages. It is, therefore, not clogged with unnecessary matter, but conveys information in a clear, straightforward manner, inspiring the beginner at once with confidence that under its guidance success will follow his endeavors.

We could not recommend a better work to the amateur.

The new edition contains, in addition to all the recent discoveries and improvements in manipulation, chapters on the new illuminator in photography, the Magnesium Flash-light, and also on Ortho-chromatic Photography.

The type is beautiful, the binding handsome, and the illustrations excellent.

THE Executive Committee of the Vienna Amateur Exhibition desire us to say that all exhibits forwarded, freight paid, to Messrs. Schencker & Co., 64 Moorgate Street, London, England, will be forwarded thence to Vienna and return free of charge. See former notice.

WE forgot to mention, in our May number, in connection with "Our Picture," that the photographs taken with Blitz-pulver were made with a Steinheil New Anti-planatic lens.

JUNE BARGAIN LIST.

Accessories:

1—Iron Centre Camera Stand,	2 50
1—8-inch Burnisher,	6 00
1—20-in Entrekin Eureka Bur-	
nisher	30 00
1—Seavey Swiss Cottage Acces-	12 00
sory	6 00
1—8x8 Interior Background,	
1—8x10 Hough's Exterior Ground,	
new, light left,	11 00
1—8x10 Exterior Ground, good	
condition,	10 00
2—Spencer Head-rests	11 00
British Journal Almanacs for 1878	20
Photo Mosaics for 1883,	20
1—8x10 Plain painted ground .	3 00
1—Knickerbocker stand, with	
14x17 top	12 00
1—8x10 Osborne's interior back-	
ground, new, light left . . .	20 00
1—4x8 Osborne's side slip . .	7 50
1—Osborne stile, new	4 50
Pearl leads, the best retouching	
point in the market, each .	15
Interchangeable View Albums,	
7x10, for 5x8 views, with re-	
movable leaves fastened by	
cord, each	1 35
Job lot fine cab. Plush Frames, each	60
8x10 Job Lot Picture frames; write	
for particulars.	

Desiring to reduce our stock, we will sell for a short time.

PER DOZ.

5x7 Woodbury Dry Plates . . .	77
5x8 " " . . .	80
4 1/4 x 6 1/2 " " . . .	65
6 1/2 x 8 1/2 Triumph " . . .	85
5x7 " " . . .	55
4 1/4 x 6 1/2 " " . . .	45
5x8 Neidhardt " . . .	65
4x5 Bridle " . . .	35

Camera Boxes:

1—6 1/4 x 8 1/2 Rochester Optical Co.	
Ideal Camera, new	22 00
1—4x5 Anthony Novalet Camera,	
lens and tripod, new	16 00
1—11x14 Scovill View Camera	
with double dry plate holder, . . .	35 00
1—8 x 10 American Optical Co.'s	
Royal Camera, double swing	
and carriage movement,	25 00
1—4x5 Bijou Camera, and two	
holders,	8 00

1—8x10 Ferrotyp Box, Carriage	
movement and glass cornered	
holder,	15 00
1—5x8 new model Camera, case,	
tripod, 2 holders and lens, .	10 50
1—5x7 Flammang revolving back	
camera, three holders, exten-	
sion tripod, Darlot wide angle	
lens and canvas case	50 00
1—4x5 Photo-Microscopic enlarg-	
ing outfit,	14 00
1—5x8 Tourist Outfit, including	
5x8 Tourist Camera Box, 2	
Daisy Plate Holders, 1 Exten-	
sion Tripod, and 1 Canvas	
Carrying Case, very little used.	
Price, new, \$40.50, will sell	
for	30 00
1—4x5 '76 outfit	15 00
1—10x12 Cone View Camera,	
Double Swing, new	52 80
1—11x14 New Haven Reversible	
Back Camera, Double Swing,	
new	44 00
1—14x17 New Haven Acme Port-	
rait Camera, Single Swing,	
new	46 00
1—4x4 Standard Portrait Camera	
wet holder, new	14 75
1—4x5 Flammang revolving back	
Camera, new,	25 00
1—4 1/4 x 5 1/2 No. 202 A. Scovill	
Outfit	20 50
1—6 1/2 x 8 1/2 View Camera and	
Lens	12 00
1—5x8 Wet Plate Stereo Camera,	
.3 holders, case and tripod .	25 00
1—6 1/2 x 8 1/2 American Optical Co.	
first qual. View Camera . .	23 00
1—4 1/4 x 5 1/2 Ex. qual. Portrait	
Camera	17 50
1—5x8 American Optical Co.,	
Stereo Camera	25 00
1—6 1/2 x 8 1/2 Standard Portrait	
Camera, web holder	13 60
1—5x8 Blair View Camera, single	
swing	17 00

Lenses:

1—1/2 size Darlot Portrait lens, .	5 00
1—1/2 size Harrison Portrait lens,	
cut for stops	10 00
1—4x4 Harrison Portrait Lens,	
cut for stops	20 00
1—1/2 size Voigtlander Lens . .	15 00
1—8x10 Morrison Peerless Por-	
trait Lens,	40 00

1—Matched pair German Stereoscopic Lenses, in good order.	15 00
1—4x5 Dallmeyer View Lens	15 00
1—Woodward Condensing Lens	10 00
1—4x4 Darlot Globe Lens	25 00
1—4x4 " " "	20 00
1— $\frac{1}{2}$ size L. W. Krantz Portrait Lens	12 50
1— $\frac{1}{4}$ size portrait lens	3 00
1— $\frac{1}{2}$ size C. C. Harrison portrait lens	8 00
1— $\frac{1}{2}$ size Darlot quick acting Portrait Lens, central stops	18 00

1—No. 6 17x20 Darlot wide angle Hemispherical Lens	35 00
1—Extra 4x4 Chapman Portrait Lens	20 00
1—8x10 E. A. View Lens	5 00
1—Ross View Lens	5 00
1—H. Fitz Double View Lens, revolving stops	8 00
1—8x10 Voigtlander Portrait Lens	80 50
1—4x4 Dallmeyer Group Lens	50 00
1—4x4 Walzl Portrait Lens	20 00
1— $\frac{1}{2}$ Beck Microscopic Objective, nearly new,	20 00

WANTED—Permanent situation as retoucher—a first-class hand.
E. URBAN, 430 N. 4th St., Philadelphia.

TO meet the frequent inquiries for a cheap *rectilinear* lens, we have put on the market the "Orthoscope." These are light, compact and quick acting, so that they can be used for instantaneous work. Sizes, 4x5, \$10.00; 5x8, \$15.00.
THOS. H. McCOLLIN & Co.,
635 Arch Street, Phila.

FOR SALE—A well-equipped and only gallery in a growing town of 6000 inhabitants. No old traps, everything new—good chance for young man with small capital. Address with stamp, Box 244, Middletown, Pa.

FOR SALE—Photograph Gallery near Philadelphia, established for one year, or will take partner with some capital to push business. Address P., care of Thos. H. McCollin & Co., 635 Arch St., Phila.

FOR SALE—Seven-room frame house nearly new, with bay window, large garret and cellar, 40 x 50 photograph gallery, on fertile lot with good variety of fruit; in a town of 1,000 inhabitants, within one minute from depot, express and freight offices. For further particulars address J. K. M., care of
THOS. H. McCOLLIN & Co.

WANTED—A Retoucher. Address, JOHN D. STRUNK, 730 Penn St., Reading, Pa.

CRUSHED Hyposulphite of Soda in neat pasteboard boxes—8 cents per pound.

FOR SALE—A gallery in Atlantic City; first-class condition, conveniently arranged, good location. Also, tent (new) and outfit. Address,
S. H. COPE,
Box 409. Norristown, Pa.

FOR SALE—In perfect condition (having been used only a few times) a No. 2 A Dallmeyer lens. This lens is used by all the best photographers for rapid portrait work, having a flat field, great depth of focus and wide opening. List price, \$148.00; will be sold for spot cash, \$90.00.
THOS. H. McCOLLIN & Co.,
635 Arch St., Philadelphia.

HINTS TO AMATEURS—A valuable book of instructions, mailed on receipt of two two-cent stamps.

TO AMATEUR PHOTOGRAPHERS—Send three two-cent stamps for McCollin's Photographic Note Book, for keeping a record of exposures.

Are you fond of using tools or tinkering? If so, send one dollar for
THE UNIVERSAL TINKER
AND AMATEUR'S ASSISTANT.

This is a new monthly journal devoted to Amateur pursuits, and tells, from an Amateur's stand-point, about Turning and Lathe Work, Painting, Staining, Working Drawings, Modeling, Organ and Piano Building, Clocks, Photography, Wood Carving, Boat Building, Home-made Furniture, Carpentry, Book Binding, French Polishing, Wood Finishing, Fret Work, Amateur Printing, The Magic Lantern, etc.

The journal is profusely illustrated. Single copies, 12 cents. Send 5 cent stamp for sample copy. Address,

A. K. BERTRAND, 294 Broadway, New York, N. Y.

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We manufacture this paper in two grades, L, light and fine, for prints from *negatives*,^{*} and H, heavy, for making copies from *tracings*, of architects' and machinists' plans, etc.

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3½ x 4¾	in. boxes of two dozen, per box,	\$.20
4 x 5	" " " "24
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6½ x 8½	" " " "60
8 x 10	" " " "80
18 x 22	per dozen,	1.00

H, HEAVY PAPER.

16 x 21	inches, per dozen,	\$.74
20 x 24	" " " "	1.10
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24 x 40	" " " "	2.20
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Sensitized rolls, 40 in. wide, 50 yards long,	40 cts. per yard.	
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Special discount in full rolls.

We are the pioneer manufacturers of this paper, and the reputation it has acquired is sufficient guarantee of its quality.

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INSTANTANEOUS PHOTOGRAPHY AT NIGHT

WITH MCCOLLIN & CO.'S BLITZ-PULVER

NEGATIVES ON CRAMER PLATES

PRINTS ON MORGAN'S BRILLIANT ALBUMEN PAPER

